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ABSTRACT

This paper reviews the research findings of recent doctoral dissertations on program budgeting in education and describes the practical applications of these findings for school administration. Organized in nine chapters, the review discusses the problems and shortcomings associated with both traditional and program budgeting techniques, and describes the positive and negative reactions of administrators who have had experience with program budgeting. The introductory chapter provides an illustration of the basic principles of program budgeting. Chapters eight and nine include specific examples of the use of program budgeting in comparing, allocating, and planning the costs of educational objectives. The annotated bibliography lists 22 relevant dissertations received by Dissertation Abstracts from 1964 to 1968. (JH)

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PROGRAM BUDGETING AND THE SCHOOL ADMINISTRATOR: A REVIEW OF DISSERTATIONS AND ANNOTATED BIBLIOGRAPHY

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September 1969

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Review Series, Number Two

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PREFACE

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In addition to acquiring and processing documents, the Clearinghouse has another major function, that of information analysis and synthesis. ERIC/ CEA prepares bibliographies, literature reviews, state-of-the-knowledge papers, and other interpretive research studies on topics in its educational area.

This review on program budgeting in education covers an important source of available knowledge that is often overlooked. Doctoral dissertations, which in most cases represent the first major research by their authors, often contain highly significant ideas and information which become the subjects of further study. As the authors of this review point out, a disproportionately large amount of the research on practical applications of program budgeting in education is to be found in dissertations.

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Philip K. Piele
Director

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I. Basic Principles of Program Budgeting: An Illustration

Here it is the last week of August and you, a tired, harried superintendent, having finally seen the budget pass (after three defeats), decide to take the rest of the summer off before the opening of school brings a recurrence of the problems and pressures which led to that tired, harried feeling from which you now seek relief. You would like to spend part of your vacation on the golf course and the rest dipping your line in that beautiful mountain lake you and the boys fished opening day. Unfortunately, the old cliché about the best laid plans of mice and men is sadly appropriate with regard to your vacation.

Your wife told you at breakfast that you had better not plan on any fishing trip or golf until you have taken care of all those repair and building jobs you have been promising her you would do since the first of the year. She reminds you that (1) the roof needs fixing (it seems the heavy snow last winter tore up the gutters pretty badly and there are several leaks which became all too obvious during the heavy rains of April and May), (2) you promised 4 months ago to build a sand box for your 3-year old daughter, (3) some shelves need to be built in the garage, and (4) lastly you should fence in your back yard. Rover has been irrigating the neighbor's prize begonias and he threatens to shoot poor Rover between the eyes if he catches him anywhere on his property again. So Rover has been tied up behind the garage for the last 2 weeks where he has been spending his days whining, barking, and trying to chew his foot off.

Since your wife has informed you in her own special way that there will be no fishing or golf until those jobs are completed, it is obvious that the quicker you get them done the more time you'll have to pursue your own pleasure. Unhappily, the way you've got it figured, by the time you finish all the work your wife has laid out for you, there will be time for about six holes of golf and two drowned worms. So if you are going to have any vacation time to yourself, you've got to hire someone to do the work. After some quick figuring, you decide that by giving up the fishing trip this summer, you can afford to hire one of the local home repair entrepreneurs--if, that is, you can get him to do the work for $550.00 or less. Even though you must forego the fishing trip, you will at least have time for a few rounds of golf and some relaxation in your favorite easy chair.

So you call up Al, one of the local jack-of-all-tradesmen, and tell him you want your roof fixed, a sand box built, some shelves made, and a fence constructed. Can he come out this evening and give you an estimate. Happy to, says Al, and about 6:30 that evening he arrives. He inspects the roof and the gutters, gets the dimensions for the sand box, measures the wall for the shelves and the back yard for the fence. Then he tells you he'll drop by your office tomorrow afternoon and give you a detailed estimate of the cost of the work. You're a little surprised that he doesn't give you an estimate on the spot, but nevertheless you tell Al that's fine--you'll see him then. Early the following afternoon, Al shows up at your office and gives you the following estimate:

Wages:	$300.00
Equip Rent:	60.00
Equip Upkeep:	10.00
Materials:	430.00
Total	$800.00

My God, you exclaim, $800 for what?! You could spend $550.00 and not a nickle more!

Now after that outburst, you fully expect to argue for 30 minutes or so after which Al will knock a few dollars off the wages, some more off the equipment rental and upkeep, and a little more off the supplies. You expect to argue with Al because you know that estimated costs really don't mean anything: They simply represent figures from which bargaining can begin. But, much to your amazement, Al does not haggle. Instead, he calmly informs you that for $550 he can:

- fix the roof, build the sand box, and make shelves, or
- build the sand box, make shelves, and construct a fence, or
- fix the roof and construct a fence;

but he cannot:

- fix the roof, build the sand box, and construct a fence, or
- fix the roof, make shelves, and construct a fence.

Totally overwhelmed, you ask Al where he got this information. A while back, Al relates, he got fed up with arguing over every estimate he submitted, not to mention the fact that he was tired of all the extra paper work caused by the errors he was making trying to calculate revisions. So he had decided

to estimate costs by outputs rather than by inputs. That is, he tried to figure out how much it would cost to fix the roof, build the sand box, make shelves, and construct a fence rather than trying to estimate how far a given amount would go toward these jobs. In other words, he estimated by program rather than by item. He then produces a sheet of paper on which are written the following figures:

A Program Budget for Assorted Odd Jobs

		PROGRAM				
		fix roof	build sand box	make shelves	construct fence	total
ITEM	Wages	$100	$50	$50	$100	$300
	Equip Rental	10	20	10	20	60
	Equip Upkeep	0	5	5	0	10
	Materials	190	70	40	130	430
	Total	$300	$145	$105	$205	$800

"As you can see," says Al, "the estimate is divided into four projects: fix the roof: $300.00; build a sand box: $145.00; make shelves: $105.00; and construct a fence: $250.00. Now, as I said before, for $550.00 or less I cannot complete all these projects, nor, for that matter, can I eliminate any of the items. Suppose, for example, to save a few dollars, you tell me not to rent any equipment. This means no extension ladder for the roof, no electric saw for the sand box and shelves, and no posthole digger for the fence. With no extension ladder, I must risk my life and limb shinnying up the drain pipe to fix the roof; with no power saw, I must saw the lumber for

the sandbox and the shelves by hand; and with no posthole digger, I must dig the post holes with a shovel--all of which will probably double my time (and thus my wages). So to save $60, you must spend an additional $300."

"I'll call you tomorrow," says Al, "and you can tell me what you decide you want me to do."

Somewhat dazed, you nod assent.

As soon as Al leaves, you pick up the sheet of paper with the cost figures and begin thinking about the alternatives that are available to you. Since it is absolutely essential that the roof be fixed before the rains begin again, that job must be completed. So that's $300.00. Now, with your remaining $250.00, you can either have both the shelves made and the sand box built or you can have the fence constructed. If Al builds a fence for you, you could let Rover run loose without having the neighbor on your back. But on the other hand, if you don't get those shelves made, you'll have your wife on your back. Since you cannot avoid her like you can your neighbor, you'd better get those shelves made. So that's $105.00 more for the shelves, which, along with the roof, adds up to $405.00. Now you can stop here and save the rest of the money for that future fishing trip, but you know your daughter has her heart set on a sand box and you wouldn't want daddy's little girl to be disappointed. You decide, therefore, to go ahead and have the sand box built. Rover will just have to stay tied up for awhile longer. Besides, even if you did build a fence, Rover would probably dig under it anyway and end up getting

his tail shot off. So it's probably for the best that he remain tied.

When Al calls the next day, you tell him to fix the roof, build a sand box, and make the shelves. All for $550.00.

"Fine," says Al, "I'll start tomorrow."

"Say, Al, before you hang up, tell me, where did you learn this technique?"

"Well, you see," replies Al, "I used to work nights as a janitor in the Pentagon, and I picked it up there!"

* * *

Although the foregoing illustration obviously oversimplifies the use of program budgeting techniques, it does serve, we hope, to make clear some of the basic principles, and to set the tone for the following discussion of program budgeting. The discussion is not technical nor does it show, in more than cursory fashion, how to program budget. Rather, its purpose is to present, based for the most part on an examination of doctoral dissertations, information that might be of use to the school administrator considering the possibility of adopting a program budget. What can a program budget do? What are its limitations? What has it done for others? What are its requirements? What are its problems? These are among the topics which will be considered.

As these various topics are considered in the following pages, references to appropriate dissertations will be made by Dissertation Abstracts number. For example, 67-8843 refers to a dissertation received by Dissertation Abstracts in 1967 and given the number 8843. An annotated bibliography,

found at the end of this review, contains all the dissertations considered and found relevant. The bibliography is arranged by Dissertation Abstracts number.

A Review of Dissertations

II. The Shortcomings of Traditional Budgeting Practices

The item or object classification budget "...is an historical outgrowth of the assumption that government employees will manipulate funds to their advantage; it makes them account for the expenditure of every dollar" (68-7662, p.5). In other words, the item or "traditional" budget is used to control expenditures, to limit employee discretion, and to check inputs (68-7662). Rather than being concerned with what is accomplished or what is gained, the traditional budget focuses on how various funds are spent.

Another basic criticism of traditional budgeting practices is that they are essentially defensive. Costs are developed with respect to estimated income rather than needed activities. Rather than informing taxpayers what their tax dollars are buying, many administrators fashion their budgets in terms of how much they think the voting public will "buy" in terms of a tax increase. In this manner, many school budgets merely become some mechanical increment greater than last year's budget (65-7839). It is thus not hard to understand why taxpayers "revolt," because the only thing they are told about school budgets is that they increase every year.

Other general problems with existing budgeting practices include a failure to select among various school activities either existing or proposed, and a failure to allocate funds by service and expenditures by use. Finally, there is a general failure to estimate various sources of income and expenditures for periods greater than a year (68-11870).

An intensive study (65-7834) of university budgets--especially those of the Big Ten schools--clearly summarizes various problems with traditional budget methods and forms. The literature on university budgeting indicates that these budgets generally record what is done, not why it is done. Commonly, budgets were not considered as a unifying device which could not only control but also plan and coordinate university activities. Big Ten budgets were found to lack cost standards, to remain centralized in the face of university decentralization, to be marginal increments of last year's budget, and to be flexible upward but not downward. Usually these budgets were rigidly constructed, offered little with respect to planning, and were extremely subjective.

Some words of caution are necessary, however, in pointing out the defects of the traditional budget. Many of the writers criticizing traditional budgeting practices do so, in part, to create strawmen which can be destroyed by some advocated technique whose description is prefixed with the word "systems." As one scholar sardonically comments: "The current position of systems analysis is similar to 'God, country, and motherhood'--almost everybody is in favor of it" (Alexander M. Mood as quoted in 68-4229). Nevertheless, the point remains that traditional budgeting practices suffer serious defects and that many writers have proposed some form of program budgeting as a corrective.

But program budgeting itself could be a defective or, at least, inappropriate substitute. While it is relatively easy to find articles and books overflowing

with generous praise of program budgeting, it is very difficult to find information about its limitations. In fact, much of the nondissertation literature has yet to advance past the promotional stage. For those contemplating adopting a program budget, however, its deficiencies and difficulties will probably be as important as its advantages.

III. Problems with the Use of Program Budgeting

Perhaps the greatest difficulty facing program budgeting, commonly shortened to PB, is the estimation of costs. How should general costs such as for plant, maintenance, capital, library, administration, and so on, be allocated over various projects? This is the fundamental problem of program budgeting, for which there are no clear answers. The simplest solution is to suggest that costs be allocated on whatever basis best describes their use. But this solution is similar to that proposed to eliminate all the world's wrongs--people should do what is right. Fortunately, the problem of cost determination has been intensively studied and various examples and procedures have been developed (64-10253; 67-8702).

Usually these procedures attempt to develop various rules of thumb by which cost allocations can be made. For example, library costs can be allocated on a per student basis, classroom costs by square foot usage, and teacher costs by relative time per project. Many times these rules are arbitrary and are used merely because no others could be constructed or imagined. If a program budget is to be used, these arbitrary rules for estimating costs must be created. The task is difficult, yet enough operating program budgets exist to indicate that it is not impossible.

Complicating the whole problem of educational cost estimation is the lack of adequate accounting systems. Costs are usually calculated on the basis of existing accounting records, but often these records are incomplete

and inaccurate. Some accounting systems are nonaccrual, exclude indirect costs, and ignore depreciation charges. Others fail to record special project costs (68-11870). Moreover, accounting methods, definitions, and codes differ from system to system. This lack of standardization, caused in part by diverse opinions as to which educational costs are relevant, leads to noncomparable data. As a consequence of these general accounting problems, adoption of program budgeting could force the adopting unit to revamp its basic accounting procedures. After all, a program budget is only as good as the data that are used to construct it.

Program budgets also ask questions which require unambiguous answers. "About" such and such number of students or "maybe" so many books are meaningless statements in a PB context. Data must be stated in an unqualified manner. For those accustomed to ambiguity, the conversion to program budgeting can be very difficult (64-7582). However, precise figures can in themselves lead to serious problems. They can give an aura of false precision and detract from serious questioning as to the construction of the budget. After all, the difference between about 10,000 and exactly 9,967 angels dancing on the head of a pin is only 0.0033 percent.

In some States, formulas have been adopted to ease difficulties in cost estimation (64-861). Student-teacher ratios, space per student, and compulsory course offerings are examples. Basically, formulas are utilized to reduce paperwork, simplify complex problems, and permit comparisons among units. While essentially worksaving shortcuts, formulas are also used to insure equitable and adequate support among units and to emphasize basic

overall educational policies. Although formulas ease local problems in cost estimation by shifting the responsibility to higher administrative levels, they suffer defects inherent in all arbitrary rules--rigidity and slavish application. Nevertheless, it appears that as sophisticated budgeting techniques are more widely used, formulas, proxies, and shortcuts of all types will be developed for cost estimations (65-4747).

The calculation of costs per individual student clearly indicates many of the basic problems in cost determination (68-12155). To calculate these costs, the assumption must be made that each student uses equally or has equal access to all facilities. Lacking this assumption, some facilities would have ridiculously high per student costs, as, for example, vocational education or interscholastic athletics. Actual student cost determination must face the problems of project identification, suitable accounts, accurate measures, and data sources--all of which test the ability and tax the ingenuity of the administrator. Compounding the difficulties of student cost estimation is the lack of a well-defined educational philosophy. Usually, there is the aspiration to generate the finest results at the lowest costs. In practice, "....unfortunately, most of the efforts for educational economy placed more emphasis upon 'the lowest cost' rather than 'the finest results' " (68-12155,p.22). The question, as yet unanswered, is: Can the finest results be gained at the lowest costs?

Another serious problem facing program budgeting is the fact that many educational activities cannot be unambiguously defined and quantified. It is well known that there are exactly 12 inches in a foot. But how many teachers

are there in a given high school? Absolute numbers give one answer; equivalent hours taught another; full-time basis still another. In other words, measurement and definition of educational activities usually require an elaborate discussion of what is being measured and how the measurements are being conducted.

Unfortunately, elaborate discussions among educators have not yet yielded agreement as to what to measure and how to measure it. What is education? How can different aspects of it be compared? How can learning be tested? The inability to answer these and similar questions leads to one of the major complaints concerning program budgeting, that it considers only the monetary aspects of education. Much of education is nonmonetary, that is, sociological or cultural, and cannot be measured in dollars. Quality, location, neighborhood, and so on, are all important aspects of education; all are usually ignored by program budgeting.

Until terms can be defined, these philosophical discussions, after a point, become meaningless. For, in point of fact, many of the defects of PB are also found in the more traditional budgeting schemes. If information is needed for decision making, and if PB provides more information than traditional methods, then it ought to be used in spite of its tenuous philosophical foundations.

Finally, there is the problem of what is relevant cost information. Program budgets can be constructed which include a variety of school dimensions, yet, in practice, many of them must be ignored (68-11870). For example, program

projects might be grade levels. Suppose the following per student costs are found:

Table 1. Per Student Costs for Grades 1-6

Grade	Per Student Cost
1	$279.81
2	283.17
3	476.21
4	289.77
5	298.13
6	294.58
Average	$288.49

Is it to be concluded, given limited funds, that third grade should be eliminated because it is too expensive? Similarly, suppose grade 12 history costs $89.72 and grade 12 vocational education costs $416.93, respectively, per student. The natural tendency is to compare the subjects and conclude that history is four times cheaper than vocational education. This comparison is invalid because the courses are noncomparable. History and similar compulsory subjects use few books and little equipment, and are taught on a mass basis. Vocational subjects, on the other hand, are voluntary, involve fewer students, and require expensive equipment. Hence, any comparison between these subjects is inherently biased. When making cost estimates or cost comparisons, therefore, the question which must be continuously born in mind is: Does this mean anything?

IV. User Experiences with Program Budgeting

In spite of its various difficulties, users almost unanimously recommend program budgeting. One dissertation, by Hall and Mattox (67-17687), extensively investigated the "in field" experience with program budgeting. A wide variety of questions were asked, answers to which were collected from the literature and from the following sources:

Table 2. Description of Hall-Mattox Sample

Questionnaire*			Interviews**	
sent	returned	location	number	location
42	35	Calif. school dist.	7	large Calif. dists.: Sacramento, Berkeley, San Bernadino, Oakland, Anony., Palo Alto, San Diego
23	13	non-Calif. school dist.		
99	42	county, city, State, Federal, large business offices	4	large dists.: New York City, Philadelphia, Pittsburgh, Chicago

*p.224ff
**p.121ff

The studies' major findings are summarized in the following table:

TABLE SUMMARIZING HILL-MATTOX (67-17687)
LITERATURE, QUESTIONNAIRE, AND INTERVIEW STUDY OF
PROGRAM BUDGETING

QUESTION	LITERATURE	QUESTIONNAIRE	INTERVIEW
1. Major purpose of PB?	1. Gain objectives. 2. Allocation. 3. Decision making. 4. Develop measures. 5. Data. 6. Make budget more understandable. 7. Planning.	1. Allocation. 2. Evaluation. 3. Evaluation of proposals. 4. Cost control.	1. Make budget more understandable. 2. Allocation and cost control. 3. Evaluation of program proposals. 4. Performance appraisal.
2. Why adopted?	1. Other successes. 2. Recommended by authorities. 3. Already in use.	1. Administrative decision. 2. Management reporting. 3. Own initiative. 4. Regulations.	1. Own initiative. 2. Regulations. 3. Management reporting. 4. Administrative decision. 5. Citizen request. 6. Tax rate or bond election. 7. Improve budgeting.
3. Has PB improved budgeting?	Yes.	75% Yes.	90% Yes.
4. Did PB increase length and/or volume of budget document?	No information.	Yes.	60% Yes.
5. Did PB violate commonly accepted standards for budgeting and accounting?	No information.	90% No.	90% No.

QUESTION	LITERATURE	QUESTIONNAIRE	INTERVIEW
6. Advantages of PB?	No clear distinction between advantages and uses.	1. Facilitates decision making. 2. Better allocation. 3. More understandable budget. 4. Better control, evaluation. 5. Planning.	1. More understandable budget. 2. Facilitates decision making, better allocation, control. 3. Evaluation. 4. Planning. 5. Reduces budget document length.
7. Weaknesses of PB?	1. Definition of program. 2. Excessive division of programs. 3. More, better personnel. 4. Increased cost. 5. Expensive equipment. 6. Difficult to measure output. 7. Quality not measured. 8. Decisions influenced by quality, opinions, prevailing standards, etc.	1. Increased length and volume of budget document. 2. Difficulty in assigning costs. 3. Additional personnel. 4. Better personnel.	1. Increased length and volume of budget document. 2. Difficulty in cost assignments. 3. Definition of a program. 4. Better, more personnel. 5. Excessive program division. 6. Expectations too high. 7. Does not make decisions. 8. Arbitrary decisions.
8. Conversion problems?	1. Increased costs. 2. More and better personnel.	1. More and better personnel. 2. More electronic data equipment. 3. Increased costs. 4. Greater decentralization of administration.	1. More electronic data equipment. 2. Increased costs. 3. More and better personnel 4. Administrative decentralization. 5. Staff resistance. 6. Difficulty in designing meaningful programs.
9. Need for more electronic data equipment.	Yes.	60% Using EDP equipment.	100% Using EDP equipment.

QUESTION	LITERATURE	QUESTIONNAIRE	INTERVIEW
10. Inclusion of costs.	Little meaningful information.	1. 50% include direct costs only. 2. 50% include both direct and indirect costs.	1. 90% include direct costs only. 2. Limited use of prorationing formulas.
11. Method of prorating indirect costs?	No information.	Time, hour consumption, quantity used, time-floor area, students.	Time, time-floor area, hour consumption, quantity used, students.
12. Cost elements used in PB?	No information.	Questions not asked.	1. All reimbursable costs. 2. Salaries, material, supplies, direct maintenance, transportation costs, other direct costs. 3. Salaries, materials, supplies, and equipment 4. All current expense elements.
13. What criteria should be used in designing a PB?	1. Allows alternatives to be compared. 2. Directly relates to objectives of organization. 3. Contains administrative relevance and effectiveness. 4. Allows meaningful breakdowns and comparisons of program elements. 5. Directly relates to sources of funds. 6. Facilitates intragovernmental relations.	(See literature review.)	(See literature review.) 1. Provides quantitative information.

QUESTION	LITERATURE	QUESTIONNAIRE	INTERVIEW
13. (Continued)	7. End product oriented. 8. Allows decentralized decision making.		
14. PB included in total budget format?	by: 1. Grade. 2. Organization, e.g., a. administration b. food services c. accounting. 3. Instructional area. a. English b. Mathematics c. etc. 4. Special programs. a. driver training b. handicapped c. etc.	Question not asked.	(See literature review.) also by: 1. School. 2. Grade level.
15. Candid comments?	No information.	99% (90 out of 91) recommended PB.	No information.

V. Program Budgeting and Decision Making

The creation of a program budget does not instantaneously eliminate major administrative problems. Some maintain that the adoption of a PB increases "rationality" in decision making. They assume that the expected benefits and costs of various projects can be estimated, from which benefit-cost ratios can be calculated. Projects can then be ordered on the basis of these ratios, with those having the highest ratios being selected until funds are exhausted. The basic defect with this argument is that educational benefits are extremely difficult to measure. While benefits from continuing in school as opposed to leaving are relatively easily measured by comparative earnings, respective benefits from teaching by television or by live teacher in grade 6 are more difficult to calculate.

Moreover, most educational alternatives are not of the polar "stay in/ drop out" variety, but are more in the mode of "liberalism" versus "conservativism." Assume, for example, that two alternative educational projects are distinguished by the differing types of textbooks, teaching methods, and teachers used. Since books, methods, and teachers all must meet certain minimum standards, the costs for these projects are essentially equal. Yet, depending on educational philosophy, benefits received by students from each project could vary widely. In other words, the only rationality PB appears to introduce into educational decision making is a greater awareness of costs. By itself, PB offers little in the way of criteria for choosing among alternatives.

An examination of the Federal experiences with PB reveals quite clearly the failure of the "choice among alternatives" argument (66-4554). In Federal bureaucracies, a definite tendency to avoid conflicts was found. Rather than make comparative choices or choices among alternatives (a conflict situation), budget reviewers usually made "across the board" cuts in all budget proposals. When conflicts arose, they usually involved the selection of longrun projects. Here comparative choices were made on such traditionally nebulous criteria as policy, public demand, or administrative consistency. After these choices were made, program budgets were then created to plan particular projects.

Budget reviewers, when considering proposed projects, appeared to make their choices on a sequential rather than alternative basis. Thus, decision making was in the form of A then B then C, etc., rather than X or Y, W or Z, etc. Also, these reviewers tended to ignore the existence of programed budgets. Instead, they used outside information, relied on various personal biases, and rarely considered budget proposals systematically. What these reviewers appeared to search for was confidence in the proposal and its planners. In short, PB has not met its expectations as the solution to governmental budgeting problems, because it does not supply much of the information sought by those who pass on the budgets.

Therefore, while program budgeting increases information, assists in decision making, and informs interested taxpayers, it does not eliminate administrators. It does not create some automatic process whereby data are

pumped in one end and the "answer" pops out the other. Capable administrators are still needed. The budget has to be designed, data sought, projects selected, controls created, and so on. Finally, everything has to be explained and justified to sometimes extraordinarily thick-skulled citizens.

VI. Opposition to Program Budgeting

Instead of embracing PB as a God-sent solution to current budgeting problems, many administrators have strongly opposed it. Why? "The hostility sometimes expressed by educators today toward efforts directed to improving educational accounting or cost measurements may well be founded in the fear that such cost data will be used as support for greater economy efforts" (68-12155,p.21). That is, fat or slack can be more easily discovered by outsiders, who consequently increase their criticisms of proposed expenditures.

Accurate cost data inevitably lead to comparisons of one form or another. Grades may be compared with grades, schools with schools, districts with districts, and so on, for anything on which numbers exist. This implies that some administrators may appear more "efficient" (incur relatively lower costs) than others. Less efficient administrators, suffering under public pressure, may be asked to justify their current operating procedures. Those who are extremely inefficient may even face the loss of their positions. The whole process of comparing administrative abilities and its inevitable results can be avoided by retaining existing budgeting procedures. These procedures--each evolving from slightly different circumstances, based on different definitions of costs, and having different methods of organization--generate individually unique data. Thus, valid comparisons among administrators are impossible.

Program budgeting is said to increase "outside" control. Local systems lose their autonomy when they are evaluated in terms of program costs rather

than in terms of the programs themselves. Federal or State recordkeeping requirements overwhelm local schools and districts. Moreover, since this outside money is needed for continued existence, local units are forced to submit to the arbitrariness of bureaucrats in another place as well as undergo the expense of maintaining their records. Yet, he who pays the piper calls the tune. Outside interference is one of the costs of seeking outside support.

Finally, there is the generally conservative nature of administrative organizations. Schools are large-scale organizations requiring administrative routines and procedures. Program budgeting is an attempt to change this routine by substituting newer, more complex procedures. This change generates uneasiness and uncertainties (68-11870). It is therefore logical, for peace of mind, for many to oppose PB merely because it is different.

VII. Use of Program Budgeting Illustrated by Example

What a program budget can actually accomplish is best illustrated by an example. Assumed in this example is the requirement by State law that school budgets be submitted in the usual line item form. Also, it is assumed that school activities can be divided into the following projects:

PK or Prekindergarten
K6 or Kindergarten through grade six
JS or Junior high school
SS or Senior high school
CS or Community service.

Budget items are divided into four categories:

IN or Instruction costs
AD or Administration costs
CA or Capital costs
EQ or Equipment costs.

Now, assume that the following costs, in thousands of dollars, have been estimated for each budget item:

Table 3. An Educational System Program Budget

		Project (in thousands)					
		PK	K6	JS	SS	CS	SUM
Item	IN	$90	$310	$240	$510	$65	$1215
	AD	15	40	30	75	5	165
	CA	10	15	25	40	5	95
	EQ	25	30	35	60	10	160
	SUM	$140	$395	$330	$685	$85	$1635

Here, instructional costs (including salaries and benefits) for prekindergarten are estimated at $90,000; for kindergarten to grade six, $310,000; and so on, for each item in each project. Presented in this form, budget items can be compared. For example, it is immediately obvious that senior high school

administrative expenses are much greater (by 15 times) than similar costs for community service activities.

Calculating the relative costs of each item is also a useful expository device. These figures are found by dividing each project item cost by the total amount of the budget. For example, the relative cost of instruction for prekindergarten is $90,000 divided by $1,635,000, or 5.5%. The relative costs of all items are as follows:

Table 4. A Relative Program Budget of an Educational System Project

Item	PK	K6	JS	SS	CS	SUM
IN	5.5%	19.0%	14.7%	31.2%	4.0%	74.4%
AD	.9	2.5	1.8	4.6	.3	10.1%
CA	.6	.9	1.5	2.5	.3	5.8%
EQ	1.5	1.8	2.1	3.7	.6	9.7%
SUM	8.5%	24.2%	20.1%	42.0%	5.2%	100.0%

In other words, for each educational dollar expended, 4 cents goes toward instructional costs in community services, 2.1 cents towards equipment in junior high schools, and so on, for each item. This table indicates, in a general manner, how the "educational pie" is cut.

Also informative are summary statistics showing the relative total costs of each item and project. The row sums of the above budget show relative total expenditures by item:

Table 5. Relative Item Costs

IN	74.4%
AD	10.1
CA	5.8
EQ	9.7
Total	100.0%

while the column sums indicate relative total expenditures by project:

Table 6. Relative Project Costs

PK	8.5%
K6	24.2
JS	20.1
SS	42.0
CS	5.2
Total	100.0%

The data for this budget, though detailed, are neatly summarized and easy for interested laymen to understand. Presenting the budget in this way helps to shift attention away from the "nit-picking" and to the basic educational activities themselves.

Keep in mind, however, that these figures could be "too high" or "too low". They must be compared against those calculated for other, comparable, school systems. By this procedure, the administrator can form an opinion as to what constitututes a "normal" value for each budget item. Then, when a percentage calculated for an item deviates widely from its norm, the administrator can investigate further to determine why his school system is different.

Sometimes, however, systems use different methods for calculating budget item costs, thereby making intersystem comparisons invalid. Hence, the administrator must rely on an intrasystem or project-by-project comparison.

For comparability, all costs must be reduced to a common denominator. Of those available, per student costs are the most widely used. Assume the following enrollment for each project:

Table 7. Enrollment, by Project

PK	600
K6	1850
JS	1600
SS	2900
CS	950
Total	7900

Dividing each project's enrollment into its item costs yields:

Table 8. A Cost Per Student Program Budget

	Project					Aver. Cost
	PK	K6	JS	SS	CS	per Student
IN	$150.00	$167.56	$150.00	$175.86	$68.42	$153.80
AD	25.00	21.62	18.75	25.86	5.26	20.89
CA	16.67	8.11	15.63	13.79	5.26	12.03
EQ	41.67	16.22	21.88	20.69	10.53	20.25
Sum	$233.34	$213.51	$206.26	$236.20	$89.47	$206.96

The figures in this table represent per student costs and are calculated by dividing each project item by the project's enrollment. For example, SS instructional costs, divided by the number of SS students, yields the SS per student instructional costs $\frac{\$510,000}{2,900} = \$175.86$. Also note that average cost per student, a useful "bench mark", is found by dividing each total item cost by all students. For example, the average cost per student of instruction is $\frac{\$1,215,000}{7,900} = \$153.80$, and so on for each item total.

Average costs per student can also be calculated for each project. In junior high school, for example, the average student cost is $206.26, of which $150 is spent for instruction, $18.75 for administration, and so on. The average cost per student for all projects as a whole is $206.96. Thus, instructional costs in PK, JS, and CS are "below" the overall average costs per student while in K6 and SS, costs for this item are "above" the overall average.

Immediately obvious is the "low" per student cost in community services. The most likely cause of this is that community services usually consist of part-time night courses which are inexpensive and require less student participation time. In other words, students in CS are in school one-half the time of students in other projects, therefore making two CS students equivalent to one student in any other project. For per student costs to be accurate, students must be assumed to be approximately equal. If this assumption cannot be made, then comparisons among various groups of students are invalid for much the same reason that apples and oranges cannot be compared. To compensate for the half-time attendance of CS students, then, each of the various item costs under CS in the preceding table must be doubled. After this "equalization", student costs per project become:

Table 9. An Equalized Cost Per Student Program Budget

	PK	K6	JS	SS	CS	Aver. Cost per Student
IN	$150.00	$167.56	$150.00	$175.86	$136.84	$162.54
AD	25.00	21.62	18.75	25.86	10.52	22.07
CA	16.67	8.11	15.63	13.79	10.52	12.71
EQ	41.67	16.22	21.88	20.69	21.06	21.41
Sum	$233.34	$213.51	$206.26	$236.20	$178.96	$218.73

It becomes immediately apparent that the CS project, whose students are realistically half-time, caused average student costs to be understated.

By examining this standardized program budget, a sharp-eyed administrator can immediately notice some interesting comparisons. For example, the prekindergarten project is definitely expensive in that, on a per student basis, it utilizes more capital and equipment and nearly as much administration as any other project. Also obvious is that community services is the least expensive project with respect to two items as well as on overall average cost. Total item average costs are useful for quick identification of extremes. Thus, while the average per student instructional cost is $162.54, senior high school, with $175.86 per student, is the "most" expensive, and community services the "cheapest" at $136.84 per student. These and similar comparisons are useful and accurate guides for the administrator as he seeks to economize on various activities or to vitalize sagging projects.

Now, suppose a majority of taxpayers object to the budget and demand substantial cuts. As a consequence, the Board of Education decides to eliminate the prekindergarten and kindergarten projects. Given some reasonable assumptions, how much might be saved by this action? That is, since the PK costs are already known, how much does kindergarten actually cost?

Since the K6 project budget is, in fact, a summary of various smaller budgets, it must be divided into its component projects so that the costs of kindergarten can be determined. The Board of Education decision forces this division to be on the basis of grade level. To determine various costs,

supplementary information, usually available from standard administrative records, is also required. This information is included in the following K6 program budget:

Table 10. A K6 Program Budget, by Grade Level, with Supplementary Data

Grade Level
(in thousands)

Item	K	1	2	3	4	5	6	SUM
IN	$37.0	$41.0	$43.0	$41.0	$49.0	$46.0	$53.0	$310.0
AD	15.0	4.0	4.0	4.0	4.0	4.0	5.0	40.0
CA	1.7	2.5	2.0	2.0	2.0	2.3	2.5	15.0
EQ	4.4	4.7	3.9	4.1	4.0	4.3	4.6	30.0
SUM	$58.1	$52.2	$52.9	$51.1	$59.0	$56.6	$65.1	$395.0
Students	271	291	242	251	244	266	285	1850
Classrooms	6	9	7	7	7	8	9	53
Teachers	5	6	6	6	7	7	8	45

In this budget, instruction was allocated by total teacher cost per grade, administration by the relative share of total administration time, capital by the number of classrooms per grade, and equipment by per student cost.

PK and kindergarten are to be dropped. What are the savings?

Table 11. Estimated Savings from Elimination of Prekindergarten and Kindergarten

(in thousands)

	PK	K	SUM
IN	$90	$37	$127
AD	15	4	19
CA	2	0.3	2.3
EQ	25	4.4	29.4
SUM	$132	$45.7	$177.7

The estimated savings resulting from elimination of the two projects, when expressed as a ratio to the total costs of the educational system, become:

$$\frac{\$177,700}{\$1,635,000} = 10.9\%$$

The most obvious aspect of this estimate is that the elimination of a project does not necessarily "eliminate" all of its costs. The total cost of these projects is $58,100 (total cost of K--see Table 10) + $140,000 (total cost of PK--see Table 3) = $198,100; yet only 90% of this total, or $177,700, was eliminated. This is because some expenditures are made for periods longer than a year. Thus, in PK, only $2,000 is saved in capital costs when the project is dropped. The remaining cost, $8,000, represents long-term capital costs for buildings, classroom fixtures, and so on. Similarly, in K, only $300 is "saved" in capital costs. The small savings in administration result from kindergarten being the first step in the regular educational process. When this step is begun, many new records must be created, thereby generating a high project administration cost. Since this cost cannot be avoided, it cannot be eliminated and must, therefore, be shifted onto the first grade, the new first step.

The revised educational system program budget is now:

Table 12. A Revised Educational System Program Budget

	Project (in thousands)				
	GS	JS	SS	CS	SUM
IN	$273	$240	$510	$65	$1,088
AD	36	30	75	5	146
CA	22.7	25	40	5	92.7
EQ	25.6	35	60	10	130.6
Sum	$357.3	$330	$685	$85	$1,457.3

In summary, the above example indicates some of the possibilities which program budgeting and similar techniques offer to the administrator. Applications of the techniques appear to be limited only by the imagination of the user and his ability to "create" meaningful statistics.

VIII. Planning and Other Uses of Program Budgeting

An interesting aspect of the program budget is that it is merely an explicit statement of the procedures used to construct the traditional school budget. That is, the allocation of various cost items to particular projects is also a stage in the creation of traditional item budgets. Usually this allocation is a "guesstimate" made according to ad hoc rules and traditional practices. A program budget then, merely makes explicit what is already done implicitly.

The results of this explicit statement are extremely useful. Each project can be divided by its student enrollment to determine average student cost per project. Also, average teacher cost per project and relative administrative loads, capital burdens, and equipment shares can be found. With these ratios administrators have additional information to examine when distributing funds. For example, the cost per student in prekindergarten classes might be so high, relative to average student costs in other projects, that a serious reevaluation of this project ought to be considered. Likewise, other ratios, depending on their relative magnitudes, can be used to indicate areas where economies ought to be sought or expenditures made.

Program budgets not only can give information as to how money is currently being spent, but they can also be used for planning future expenditures. Rather than waiting for problems to arise, suppose an estimate is made of the demand for school facilities for the next 5 years. With this estimate in hand, planning

can begin now to eliminate future uncertainties. Program budgets must be constructed for each of these years. Such planning is very difficult, for it requires not only an evaluation of future needs given existing standards, but also of future standards given existing needs. However, once these program budgets are estimated, some powerful administrative tools are created.

For example, a planning budget by item,

Table 13. An Item Planning Budget for School XYZ, 1969-1974.

	Actual 1969	Est. 1970	Est. 1971	Est. 1972	Est. 1973	Est. 1974
IN						
AD						
CA						
EQ						
Total						

and by project,

Table 14. A Project Planning Budget for School XYZ, 1969-1974.

	Actual 1969	Est. 1970	Est. 1971	Est. 1972	Est. 1973	Est. 1974
PK						
K6						
JS						
SS						
CS						
Total						

can be combined to construct a program planning budget:

Table 15. A Program Planning Budget of School XYZ, 1969-1974.

	Actual 1969	Est. 1970	Est. 1971	Est. 1972	Est. 1973	Est. 1974
PK						
IN						
AD						
CA						
EQ	___	___	___	___	___	___
K6						
IN						
AD						
CA						
EQ	___	___	___	___	___	___
JS						
IN						
AD						
CA						
EQ	___	___	___	___	___	___
(etc.)						
Total						

The program planning budget can be used as a guide to future courses of action. It creates a time perspective that not only indicates the chronological ordering of events but also the nature of future objectives and activities.

Program budget projects need not be restricted to prekindergarten, kindergarten through grade six, etc., but can be constructed by nearly any criteria considered relevant. Subject taught, grade, student, school, school district, etc., can each be used to define a project. Table 16 presents an example of a program budget which indicates the allocation of instructional costs in a senior high school.

Table 16. Allocation of Senior High School Instructional Costs, by Grade, Course, and Grade Study Program

	Eng.	Hist.	Math.	Chem.	P.E.	Voc. Ed.	Special (etc.)	Total
Grade 10								
I								
II								

(continued)

Table 16. (Continued)

	Eng.	Hist.	Math.	Chem.	P.E.	Voc. Ed.	Special (etc.)	Total
Grade 11								
I								
II								
III								
Grade 12								
I								
II								
III								
IV								
Total								=

IX. Conclusion

Besides indicating various operating and performance aspects of education, planning and program budgets have a number of other uses. They are politically useful in that they can be used to inform taxpayers where their money is actually going. Nebulous item budget entries take on added dimensions as they are subdivided according to project. Taxpayers can see, in a general but meaningful way, how their money is being spent (67-1110). Program budgets can also be used to interest outside sources of funds in various contemplated special projects. Rather than asking some foundation for a certain amount of money to study a problem, the foundation could be told that for the certain amount, spent in a PB manner, certain specified objectives might be gained.

Since PB can be used for future planning, it can give some indication of future needs. With this information, administrators can immediately begin various public relations programs to inform interested citizens of the nature of these needs and of the resources required to meet them. Instead of springing a huge, unexpected request upon the taxpayers, a program planning budget allows advance time which can be used to justify the budget request or a longer time period over which the increased needs can be averaged.

Since program budgets are more sophisticated than traditional item budgets, their critics must likewise be sophisticated. Rather than arguing at public school budget meetings for hours over the number of shovels to buy, buses to use, teachers to hire, and so on, the presentation of a public program budget

forces taxpayers to consider various budget projects and to decide among them on their relative merits. This consideration requires study and a willingness to understand what various expenditures are designed to gain. Since taxpayers must choose, they must have information, and the primary source of information is the school administrator. The net effect is that taxpayers and administrators must work together, rather than in opposition, in creating the school budget. The most important aspect of program budgeting, therefore, is that it induces a frame of mind which leads to a more rigorous statement of educational objectives and their related costs.

Annotated Bibliography

Dissertations are arranged in decreasing chronological order by Dissertation Abstracts number. This number indicates the year received and the dissertation's number. For example, thesis 68-12155 was received in 1968 and numbered 12155. All of the bibliography entries can be ordered from University Microfilms, 300 North Zeeb Road, Ann Arbor, Michigan 48103.

68-12155. Luhmann, Philip R. Cost accounting for individual student programs.

A very nice study which works out a method to allow both item and program budgeting. Essentially a very precise account coding program that can be used to indicate educational costs on a per student, per course, per grade, per school, and so on, basis. While the method is not well discussed, it is well illustrated and ought to be studied for application in other places.

68-11870. Hagen, John W. A three dimensional program budget for public schools.

One begins here for an introduction to PB: What is it, what it can do, what it cannot do, how to install it, its problems, its limitations, problems of the traditional techniques, and much more. Also, a very good review of applications and related literature.

68-7662. Luben, Ralph A. Planning-programming-budgeting system: A strategy for project evaluation.

A very detailed economic analysis of a Bureau of Land Management project. A nice example of how PPBS might be used to calculate benefit/ cost ratios and create decision criteria. Discussion of problems, limitations, and other related aspects of application; long and involved.

68-5963. McCamley, Francis P. Activity analysis models of educational institutions.

Some interesting, but sophisticated, mathematical models of a small college. Also a review of the economics literature pertaining to this approach.

68-4229. Trzebiatowsik, Gregory L. An evaluation of the instructional systems approach in higher education.

A general discussion of theory and application of systems method to instruction in higher education, with examples. Generally poor application results are good examples of not completely defining terms and variables. Thesis raises questions as to the relevant measures of a course's utility, content, and output. A question: Is the method worth the effort?

68-4153. Hemink, Lynn D. Measuring efficiency and effectiveness of university instruction--a Central America case.

Although not directly concerned with PB, this thesis is still an interesting attempt to measure university efficiency and effectiveness. The technique is based on ratios of those entering to those graduating, taking finals, etc.

68-366. Lee, Daniel P. A simulation of the receipt and allocation of fiscal resources in a school system.

Mostly discusses curve fitting and forecasting. Gave no good reason why estimating equations were used; that is, the study lacks a theoretical model. Results are not interesting, nor were they tested. Has a good bibliography.

67-17687. Hill, Lemar L., and Frank L. Mattox. Program budgeting in public school districts.

Ascertains the purpose, procedure, techniques, and formats of PB as compared with the traditional item budget. A very useful study on current opinions about PB. Thesis contains good chapter summaries and asks questions about PB that most do: How does PB work for you?, do you like it?, why?, etc. Also reviews the literature, advantages, and disadvantages of PB. Contains a mechanical, uninspired introduction, yet asks interesting questions simply, and explains answers well. Very good for an insight into "field" opinions on PB as found in the literature and in a variety of geographical locations.

67-17532. Chamberlin, Gordon L. A program budget for education.

An incomplete and simple application of PB. Most of the thesis is in the appendix, which is not explained. Does not explain procedures to calculate various aspects of PB. The study is not long enough, and the presentation is often confusing.

67-11405. Vxer, Sr., John E. An operations research model for locating area vocational schools.

A nice logical approach to determining if a local vocational school in New Mexico will be successful. Author tries to rank important variables and estimate "success" based on this ranking, while also estimating the probability of success. The method allows qualitative variables to be expressed quantitatively. Thesis is generally short and to the point with a useful discussion of statistical methods, data requirements, etc.

67-8702. McGrew, William C. Financial reporting for school districts in Oklahoma.

Explains conversion of an item budget into a program budget. Good example and discussion of techniques, problems, etc. Also interesting with respect to allocation techniques and general determination of program costs. Makes an assumption for his analysis which is highly questionable: "It is assumed that the administration of the school system is in the hands of qualified administrators."

67-1110. Fitzsimmons, Warren B. A model for a public school program budget.

An empirical study of a Roswell, New Mexico, school which finds PB feasible. A very detailed explanation of data required and processes followed to convert line item budgets to PB. Contains much information of the "how to do" variety, including questionnaires. The study lacks good summary tables, and is weak on cost prediction and interpretation of results. Some aspects are not well explained, but nevertheless the study is well worth working through to see exactly how a PB can be constructed.

67-551. Gold, Benjamin K. Quantitative methods for administrative decision making in junior colleges.

Thesis contains some interesting examples of various quantitative methods as applied to junior college programs. However, problems selected are very much like those in business. Has no startling results or new approaches to old educational problems. Not much in the thesis besides examples which can be found in any operations research text.

66-12435. Swanson, Jr., Paul J. Programmed budgeting for a college of business administration.

A very well done thesis that starts at the basics and works through the complete process of programed budgeting, including discounted cash flows, linear programing models, etc. Thesis is difficult, abstract, and mathematical, but well worth the effort taken to work through it; where the mathematically inclined ought to begin.

66-4554. Jernberg, James E. Program budgeting: The influence, effects, and implications of reform.

Good study of five agencies which indicates the impact of PB on U.S. Government budgetary procedures. Goes into many aspects of actual budget formulations and evaluation; discusses the process of getting the budget approved, using the technique of content analysis. Compares the actual process with that which the Hoover Commission thought PB would bring about. Concludes that the big failure of PB is that it is essentially a conflict device, e.g., for selection among competing alternatives, yet legislators desire most to avoid conflicts.

66-3532. Sherwood, Robert P. Cost implications of specific State legislation requirements: An application of program budgeting to selected California unified school districts.

Examines State legislative regulations to determine their impact on fiscal affairs of unified districts with respect to (1) tax rates, (2) spending patterns, (3) program flexibility, and (4) financing requirements. The intent of the thesis was to estimate the cost of various mandatory State programs and then assess their impact on various schools. The thesis is not PB in the usual sense. Author found greater costs and more impact on poorer schools. Most of the results are in the appendixes.

65-7834. Burns, Thomas J. State university budgets.

An extremely perceptive study of university budgets, arguing forcefully that the economic theory of the firm cannot be applied to universities. Explains clearly many of the existing problems, and, equally as important, why they arose. Using accounting techniques, the author applies them to various budgeting problems. Also considers nine of the Big Ten budgets in various aspects. Shows that diversity of objectives and funds, as well as faculty objections and poor coordination lead to many problems. Suggests that each faculty member be required to submit an individual budget outlining plans (class load, research, etc.) which can be used to plan the overall university budget and as an evaluative device. In sum, a nice, well done thesis that discusses many problem areas and contains many good ideas for further development.

65-4747. Reed, Russell L. Cost analysis of collegiate instruction and research: Principles, uses, and procedures--discussed and illustrated.

A study of cost data in higher education and an attempt to develop methods by which instruction and research might be analyzed. Thesis starts slowly, but builds up to an interesting discussion of cost measurement techniques which are applied to Columbia Teachers' College. In effect, a detailed explanation of cost accounting, with extensive appendixes.

64-10253. Knapp, William D. Resource allocation in education: An analysis of educational input.

A very long list of educational inputs and how they might be measured, ad hoc. Ignores time as a factor in measurement. Author's idea of systems analysis is näive, but he does present an interesting, informative review of statistical attempts to measure costs of education.

64-8333. Roe, Arnold. An adaptive decision structure for educational systems.

An engineering thesis--not on PB--which presents much information on the economics of education, especially with respect to educational benefits received by engineers. Some interesting mathematical techniques.

64-7582. McComb, Harry F. A functional analysis, comparison and evaluation of manual and computer procedures for processing accreditation data in the Florida public schools.

Considers the problems of going from a manual to a computer method, and finds that communications between systems engineers and administrators is a basic problem. These groups lacked a common definition of important problems, spoke different languages, and thought differently. Many problems were found to involve data collection: Administrators unwilling to give yes or no answers or to read instructions; difficult to design universal questions or to instruct users; error and mailing expenses high. Defines the limitations of computer data processing systems as follows: Inflexibility of the resulting system, high original cost, time required to adopt it, as well as greater cost, space, and personnel requirements. Advantages: Decreased processing time, increased data collected, and increased comprehensiveness of evaluations. Thesis is generally well written and informative, but dated. Author shows clearly that computers do not answer all, but merely answer more.

64-861. Miller, James L. State budgeting for higher education: The use of formulas and cost analysis.

A fundamental and long analysis of all aspects of budgets: Their problems, procedures, estimates, applications, and limitations. Includes an extensive bibliography. Definitely the place to begin for an understanding of U.S. budgets and their development.